

## Stopping at Two: The green gains from smaller families

World population will have more than doubled from 2.5 billion in 1950 to 6.8bn by 2009, in less than a lifetime, and is set to grow by another 2.4bn to reach 9.2bn in 2050<sup>1</sup>. Fertility has fallen in most parts of the world as women have gained access to education, jobs and modern contraception, and won greater independence - although 38 per cent of married women still do not use contraception.<sup>2</sup> From an average of around five children in 1950, women have reduced the number of children they have to 2.55 today, and this is expected to fall to 1.85, just under the “replacement rate” of about 2.1 children, in 2045-2050<sup>1</sup>.

No precise calculations are available for the effects of “stopping at two” globally. But if women worldwide decided to have, statistically speaking, half a child fewer than they are expected to have, there could be 1.4 billion fewer people on the planet in 2050 – 7.8 billion instead of 9.2 billion<sup>3</sup>. To achieve this, fertility would have to fall to 1.35 children per woman by 2050. The more couples decide to have just one or two children, or even remain childless<sup>4</sup>, the greater the benefits both for rapidly deteriorating ecosystems and in terms of demand for dwindling energy and food resources.

There are no official projections for the UK showing the effect of combining balanced or “zero net” migration with a family size of not more than two children, and because fertility and migration interact it is not possible to make an exact projection using simple calculations. However our new analyses for the Stop at Two campaign

indicate that a combination of age-balanced zero net migration and a total fertility rate of 1.42 children from 2010 could reduce the projected population of 77 million people in 2050 by 21-23 million, shrinking it to 54-56 million – some 6 million fewer people than today, and 7 million fewer than with zero net migration alone. This would be enough to “re-green” an area larger than Wales (see below). In the UK, average completed family size (CFS) has been falling, from a peak of nearly 2.5 children for women born in the mid-1930s to an average of 1.96 for women born in 1961.<sup>5</sup> In the latest population projections published by the ONS in October 2007<sup>6</sup>, it is assumed that the Total Fertility Rate (TFR)<sup>7</sup> will level off at 1.84 children, on average, by 2019. In the ONS *Zero Migration Variant Projection*, this TFR combined with a zero migration effect<sup>8</sup> and life expectancy changes would take population from 61.0 million in mid-2008 to 63.8 million in 2031, then reduce it to 62.4 million in 2050. Replacement-level fertility is an average 2.1 children per woman, and average completed family size (CFS) in the UK is already below replacement level. A distribution of family sizes “consistent with the long-term CFS assumption” is that nearly 20 per cent of women born in 1995 or after will remain childless, 18 per cent will have one child, 36 per cent have two children, 16 per cent have three, and 10 per cent have four or more<sup>9</sup>. If the 26 per cent of women expected to have more than two children were to decide to “Stop at Two”, the effect would be to reduce long-term average family size from 1.84 to 1.42 children.<sup>10</sup>

The environmental and quality-of-life benefits of living in a UK with at least 20 million fewer people in 2050 than the 77 million<sup>6</sup> expected are potentially enormous. Given the clear and urgent need for climate change emissions reductions and greater self-sufficiency in food and energy, the contribution of population decrease cannot be overlooked. These “green gains” include:

**Climate change targets.** The UK targets set by the government’s committee on climate change in December 2008 are to cut greenhouse gas emissions by 80 per cent from 1990 levels by 2050 and 21 per cent from 2005 levels by 2020. In 2005 emissions *per capita*, with a population of 60.24 million, were 10.89 tonnes of CO<sub>2</sub>e a year, and for that number of people emissions would have to be cut to 8.17 tonnes a head by 2020. But with population expected to rise to 66.75m in 2020, emission ‘rations’ would need to be reduced to 7.37 tonnes per person – a cut of nearly another tonne due to population growth. With 21-23 million fewer people in 2050 than the 77 million projected, long-term targets could be further eased.

**Green space/land.** The UK is one of the most densely populated countries in the world with 252 people per km<sup>2</sup>. With 77 million people in 2050 density would rise to 318 people per km<sup>2</sup>, but with 55 million it would fall to 227 per km<sup>2</sup>. If 55 million people (22 million fewer than expected) could be housed and supported by infrastructure at the same average density<sup>13</sup> as the current 61 million, 23,800 km<sup>2</sup> of land would be released for re-greening, to produce food and energy resources for its human inhabitants and revitalise other stressed species – a green land gain larger than Wales<sup>14</sup>.

**For parents who are seriously considering ways to improve the natural environment for future generations, it is clear that limiting their family size to two or fewer can make a significant difference.**

## REFERENCES AND NOTES

**1** - *World Population Prospects: The 2006 Revision, Medium Variant Projection*, Population Division, Dept of Economic and Social Affairs, UN, 13 March 2007. **2** - *2008 World Population Data Sheet*, Population Reference Bureau, 2008. The United Nations Population Fund (UNFPA) estimates that at least 200 million women do not have access to effective contraception. **3** - *World Population Prospects: The 2006 Revision, Low Variant Projection*, UN 13 March 2007. **4** - *Assumptions underlying the results of the 2006 Revision*, UN 13 March 2007. If every mother had a replacement-size family from now until 2050, world population would still reach 8.9bn in 2050, due to population momentum [*Instant Replacement Fertility Variant Projection, The 2006 Revision*, UN 13 March 2007]. Replacement-level fertility is about 2.1 children per family in the developed world, but higher in less developed regions due to higher child mortality. **5** - *UK National Population Projections (2006-based)*, report published in 2008, p17. **6** - *UK Principal projection, 2006-based population projections, published October 2007*, ONS. **7** - The Total Fertility Rate (TFR) is the average number of children that a group of women would have if they experienced the age-specific fertility rates for a particular year throughout their childbearing lives. It provides a snapshot of the current level of fertility but does not represent the experience of a ‘real’ group of women. The Completed Family Size (CFS) is the average number of children born in a particular year that women have had by the end of their childbearing years and does

represent the fertility experience of real generations of women. The CFS is affected only by changes in the total number of children women have and not by the timing of births within women's lives which affects TFR. In the latest projections the CFS is assumed to fall further from 1.91 children for women born in 1965 (who are now toward the end of their childbearing years) to 1.84 for women born in 1990 or later. But this average completed family size is derived from different family sizes, from no children to four or more. **8** - *Zero migration variant projection, 2006-based population projections*, ONS. This projection assumes no inward or outward migration at all. The results would be the same with theoretically balanced migration (A) if the numbers, age structure and fertility patterns of immigrants corresponded exactly with the numbers, age structure and fertility patterns of emigrants. The results of actual zero net migration (B) would not be the same, as the age structure and fertility of immigrants is higher than that of emigrants. So to achieve a zero migration result given current patterns, emigration would have to be higher than immigration – a net outflow. OPT's figures are based on assumption (A). **9** - *Table 6.5, National Population Projections (2006-based)*, p22, report from

ONS 2008. **10** - The result of such a decrease would be to increase the proportion of older dependents (of state pensionable age) in the UK, but this would be partly offset by the decrease in younger dependents (aged 0-15). **11** - The UK contributes about two per cent to global man-made greenhouse gas emissions and CO<sub>2</sub> accounted for about 85 per cent of the UK's man-made greenhouse gas emissions in 2006 [DEFRA]. **12** - In 2008 61 million people inhabited the UK's 242,510 km<sup>2</sup>. [*Land by agricultural and other uses*, DEFRA.] **13** - *Table P261 Land Use Change: Previous use of land changing to developed use, England 1989-2006*, DCLG. Housing is already built nearly twice as densely as it was three decades ago. In 1990 an average 23 homes were built per hectare (100 ha = 1km<sup>2</sup>) in England, but this rose to 44 in 2007 [*Table P231 Land Use Change: Density of new dwellings built, Provisional, England 1989 to 2007*, DEFRA]. From 1990 to 2004 a total 75,190 hectares of previously undeveloped land was changed to developed use, much of it from agricultural land and the Green Belt. This does not allow for development to meet the existing unmet needs of the current 61 million population. **14** - Wales has a land area of 20,730 km<sup>2</sup>.

Briefing by Rosamund McDougall – February 2009

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